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ABSTRACT

Recent research has identified several long-term negative life outcomes associated with teenage childbearing for parents and their children. To better understand teen births, data from the National Education Longitudinal Study of 1988 were used to examine factors associated with a second teen birth or a closely spaced second teen birth within 24 months. Results of this study are reported here. Out of a sample of 589 teen mothers, 34.5% had a second birth at any point in their teens, and among a sub-sample of young teen mothers (n=475, under age 18 at first birth), 27.6% had a closely spaced second teen birth. Factors associated with postponing a second teen birth included characteristics measured prior to the first birth (race/ethnicity and school type), at the time of the first birth (age at first birth, dropout status and marital status), and after the first birth (living situation, child care support, and educational and employment status). Among the full sample, younger teens were more likely to have a second birth at any point. Teen mothers who were involved in educational activities or (among older mothers) employment activities, even part-time, were more likely to postpone a second teen birth. (RJM)

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POSITIVE OUTCOMES AMONG SCHOOL-AGE MOTHERS: FACTORS ASSOCIATED WITH POSTPONING A SECOND TEENAGE BIRTH

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Abstract

Data from the National Education Longitudinal Study of 1988 (NELS:88) were used to examine factors associated with a second teen birth or a closely spaced second teen birth within 24 months. Out of a full sample of teen mothers, 34.5% had a second birth at any point in their teens, and, among a sub-sample of young teen mothers (under age at 18 at first birth), 27.6% had a closely spaced second teen birth. Factors associated with postponing a second teen birth included characteristics measured prior to the first birth (race/ethnicity and school type), at the time of the first birth (age at first birth, dropout status and marital status), and after the first birth (living situation, child care support, and educational and employment status). Interestingly, among the full sample of teen mothers, younger teens were more likely to have a second birth at any point; however, among the sub-sample of young teen mothers, the younger mothers were less likely to have a closely spaced second teen birth. Analyses also indicate that teen mothers who were involved in educational activities or (among older mothers) employment activities, even part-time, were more likely to postpone a second teen birth. Additionally, teen mothers who completed their GED or high school diploma were more likely to postpone a second teen birth.

Recent research has identified several long-term negative life outcomes associated with teenage childbearing for parents and their children. Teen mothers have, on average, lower educational attainment and a greater risk of welfare dependence and poverty than women who postpone childbearing past their teen years (Furstenberg, Brooks-Gunn and Morgan, 1987; Hofferth, 1987; Maynard, 1997; Moore et. al., 1993; Upchurch and McCarthy, 1990). Children of teenage mothers are more likely to fall behind in school, to experience behavioral problems, and to become teenage mothers themselves (Furstenberg, Levine, and Brooks-Gunn, 1990; Kahn and Anderson, 1992; Manlove, 1997).

Approximately one-fifth of teen births in the United States are second birth order or higher (Moore, Romano, Gitelson & Connan, 1997). Having a second child during the teen years appears to heighten the risk of poor educational and economic outcomes for young women and their children to an even greater extent than having a first teenage birth. Teenage mothers who experience a subsequent teenage birth are more likely to drop out of school and, among older teens, to have lower levels of educational attainment than teens who experience either one birth or no births during their teens (Kalmuss and Namerow, 1994; Scott-Jones, 1991). Mothers who have a second birth in their teens have lower rates of labor force participation, lower earnings, and less prestigious jobs with fewer opportunities for career advancement than women who postpone additional births (Hofferth, Moore, and Caldwell, 1978). As a result of their accelerated family building behavior, teenage mothers are at a greater risk of poverty and welfare dependence in later life (Furstenberg et al., 1987; Moore et al., 1993). Repeat teenage births have an added health risk of being low birth-weight (National Center for Health Statistics, 1994).

One of the goals presented by a National Research Council study panel on adolescent pregnancy and childbearing in the mid-1980s was to "prevent subsequent untimely and

unintended births" (Hayes, 1987). Despite this goal, limited research has addressed the issue of second teenage births among recent cohorts of teens, and existing research provides limited information on the factors associated with postponing a second teenage birth.

This research explores heterogeneity in the life-course experiences of a recent cohort of teens who had a first birth within four years of eighth grade, and it identifies factors from the family, individual, and school that are associated with postponing a second teenage birth. It builds on recent research which has demonstrated that adolescent motherhood is not inevitably associated with negative life-course trajectories and that certain groups of teenage parents are more successful in later life than others (Furstenberg et al., 1987).

Background

Repeat Teen Births

Figure 1 presents time trends in the U.S. teen birth rate by birth order. Although most teen births are first births, over a fifth (22%) of all teen births in the U.S. were second birth order or higher, according to preliminary data from 1996, and this figure has been as high as 25% in the early 1990s (Moore, Romano, et al., 1997). Based on the trends in teen birth rates, the majority of the increase in the teen birth rate between 1986 and 1991 (when the teen birth rate increased by nearly 25%) was due to the rising rate of first teen births. However, between 1991 and 1996, when the teen birth rate declined by almost 12%, this decline was due to decreases in the rates of both first and repeat births. Based on initial estimates of repeat teen birth rates by race/ethnicity, African American teens had especially large reductions in their repeat teen birth rate between 1992 and 1995 (Moore, Romano, et al., 1997).

The proportion of teen births that are second birth order or higher differs by

race/ethnicity, with 26.4% of all black teen births being repeat births, followed by 23.2% of Hispanic teen births and 18.8% of white teen births, as of 1995 (Rosenberg et al., 1995). Data from the National Center for Health Statistics from 1985 and 1991 indicate that the proportion of repeat teen births was higher among mothers who had not yet completed high school than mothers who graduated from high school, and was higher among married teens than unmarried teens (Sugland, 1994). The prevalence of second teenage births, along with the concentration of these births among disadvantaged teens, demonstrates the importance of identifying factors associated with postponing second teenage births.

Recent Research

A number of studies using data from the 1970s examined the influence of family background characteristics and marital status on the likelihood of a second teenage pregnancy or birth. These studies found an increased risk of a second teenage pregnancy or birth among teenage mothers who came from less advantaged families, who were married prior to their first pregnancy, and who were younger teens at their first pregnancy (Bumpass, Rindfuss and Janosik, 1978; Ford 1983; Koenig and Zelnik, 1982; Mott, 1986). Subsequent institutional changes in school-level policies, including the passage of Title IX in 1972 (preventing discrimination based on pregnancy) and programs targeted to at-risk teens and teenage mothers, may have altered the characteristics associated with having a second teenage birth.

More recent studies have examined the influence of schooling, welfare receipt, and employment status after the first birth on the likelihood of having a closely spaced second pregnancy or birth. Using a nationally representative study of women age 14-21 in 1979, Kalmuss and Namerow (1994) found that subsequent childbearing among teenage mothers was

influenced by family background, schooling, and marital status. Teenage mothers who completed at least one year of school after their first birth were significantly less likely to have a closely spaced second birth, while married teens were significantly more likely. Black and Hispanic teen mothers were more likely to have a closely spaced second birth.

In a longitudinal study of teen mothers who began receiving welfare in three cities between 1987 and 1991, Maynard and Rangarajan (1994) found that the most disadvantaged teenage mothers within this generally disadvantaged sample were at the greatest risk of a subsequent pregnancy and birth. Growing up in a household that received welfare at least half the time or being a second generation teenage mother increased the likelihood of a repeat pregnancy. Also, having a high school diploma was associated with a lower likelihood of a repeat pregnancy, while dropping out of school was associated with a greater likelihood. Ever being employed also reduced the likelihood of resolving a repeat pregnancy with a birth. After controlling for other factors, there were no racial/ethnic differences in the likelihood of a repeat pregnancy for this sample.

In a longitudinal study of 170 urban teens who were interviewed during pregnancy and at 6-month intervals thereafter, Gillmore and colleagues (1997) found that the youngest teens and those with a history of problem behaviors (including drug use and school expulsion or suspension) were at the greatest risk of closely spaced subsequent pregnancy, within 18 months. They found no racial/ethnic group differences, after controlling for family SES. Social development measures, such as having a best friend who was ever pregnant, length of relationship with boyfriend, and whether or not they lived with a parent were associated with the risk of a subsequent pregnancy.

Methodology and Design

Research Framework

This research contributes to previous studies by analyzing a contemporary cohort of teen moms (who had a first birth within 4 years of eighth grade) and incorporating a life-course perspective in order to assess factors associated with a second teen birth. Longitudinal analyses test whether characteristics measured either 1) prior to first pregnancy; 2) at the time of the first birth; or 3) after the first birth; influence the risk of a second teenage birth. We examine whether the relative timing of life-course transitions, including dropout status, marriage and parenthood, influence the risk of a second teen birth.

An ecological perspective further informs the analyses by positing that life-course outcomes among teenage mothers can be understood only in the context of the system of institutions and relationships in which the teens live (Bronfenbrenner, 1979). Multiple aspects of the teens' lives are incorporated into the analyses, including characteristics of teens' primary social settings: family and school. We examine whether teenage mothers who were engaged in social institutions such as school and work, and who received support from their families, were more likely to postpone having a second teenage birth. Recent educational research examining the ties between dropping out of school, obtaining a degree or GED and economic outcomes has shown that students who receive a GED are more similar to dropouts than to those who receive a diploma (Smith, 1995). These analyses also test whether receipt of a GED, as well as a high school diploma, is associated with reducing the risk of a second teen birth.

We examine the predictors of two types of second teen births: 1) another birth any time before age 20, and 2) another teen birth within 24 months of the first birth (a closely spaced second teen birth). This allows us to differentiate between two positive outcomes and compare

characteristics of teen mothers who postpone a second teen birth for at least two years with those who postpone past the end of their teen years. Thus, we used two related samples of teen mothers: 1) those who had a first birth in their teens and were at risk of a second birth at any time in their teens; and 2) those who had a first birth before age 18 and were, therefore, at risk of a closely spaced subsequent teen birth (within 24 months). Note that the young teen mothers in the second sample are a sub-sample of the teen mothers in the first sample.

Data and Research Sample

The study uses data from the National Education Longitudinal Study of 1988 (NELS:88). Collected by the National Center for Education Statistics (NCES), NELS:88 contains a nationally representative sample of U.S. students enrolled in eighth grade in 1988, and followed until 1994. Students were first interviewed in 1988, and then at 2-year intervals until 1994, or approximately 2 years after high school. A separate survey for dropouts was included in 1990 (at the equivalent of tenth grade) and in 1992 (at the equivalent of twelfth grade). NELS:88 contains over-samples of Hispanic and Asian/Pacific Islander students.

The 1994 interview provides assessments of fertility outcomes, including the total number of children ever born to the respondent and their birth dates, plus current marital status, date of first marriage, employment status and income. Detailed educational histories were provided for dropout episodes, high school completion, GED or other equivalency completion, and enrollment in further schooling after the equivalent of twelfth grade.

From the panel sample of 6,000 females who had information available for all waves of the study,[1] we extracted a sample of 596 females who experienced a school-age teen birth (within four years of eighth grade). Seven females were dropped from this sample of teen mothers

because they had a second teen birth prior to the equivalent of tenth grade, and did not have information available on their family background and school characteristics prior to having their first birth. The final sample for the second teen birth analyses includes 589 teen mothers. From this sample, we created a second sample of teen mothers who had a full 24 months after their first teen birth in which they could have had a closely spaced second teen birth. This sub-sample was restricted to those who were age 18 or younger at their first birth, and contains 475 young teen mothers.

Measures

Appendix A and Appendix B provide the definition of each variable, its range, mean, and standard deviation, for the full sample of teen mothers (N=589) and by race/ethnicity.

Dependent Variables

There are two dependent variables created for the two samples used in these analyses to indicate: (1) a second birth at any time in their teens; and (2) a second teen birth within 24 months of their first birth.

Background Characteristics in 1988

To investigate and control for racial/ethnic differences in fertility outcomes among teenage mothers, we grouped the sample into three categories: Hispanics, blacks, and whites.[2] Family background variables from the 1988 survey include parental socioeconomic status (a composite of the teen's father's and mother's education level and occupation, and family income) and family structure (whether the teen lived with both of her biological parents). Two-

measures of the eighth grade school population were included: the percent minority students attending the teen's school and the percent of students in the school receiving free lunches (used to measure the relative disadvantage of the school).

School performance and aspirations were also measured in 1988, prior to the first birth, and test scores were taken from standardized math and reading tests. Students reported their post-secondary educational aspirations, whether they were enrolled in a gifted class, had been held back a grade prior to eighth grade, or participated in a religious organization at school.

Individual characteristics at or after pregnancy or first birth

Measures taken from the time of the first birth or afterwards include the teen's age at the birth of her first child, marital status, and dropout status. We calculated the month of the first dropout episode and month of first marriage to measure the relative sequencing of having a first birth, dropping out of school or marrying, and having a second birth. Teen mothers who dropped out prior to their first pregnancy (which led to a live birth) were compared to those who dropped out after the pregnancy and those who had not dropped out at the time of the second birth or by the end of the study. Teens who married prior to or during the first pregnancy were compared with those who married after their first birth, and those who never married (either by the second birth or by the end of the study). Note that because NELS:88 data provide age at first birth and not age at first pregnancy, pregnancy timing is estimated as nine months prior to the first birth.

Measures taken after the birth of the teen's first child include the living situation after the birth of the first child (teen mother lives alone, with her parents, or with her spouse, boyfriend, or partner), child care arrangements, and whether or not the family had gone on welfare in the past two years. Help with child care from the child's grandparent and the child's father were

measured on a three-point scale, ranging from "never helps care for the child" to "helps most of the time", and was intended to be a measure of support available to the teen mother. Family welfare receipt was included as a proxy for the influence of welfare dependence.

Also, educational aspirations were measured after the birth of the first child with a 5-level variable about the teen mother's perceived chances of graduating from high school, and occupational aspirations were measured with a 0-1 variable measuring those who reported an occupation that required a Bachelor's degree or higher. Those who reported an "other" occupation, which was not classifiable to education level were also included as a control.

Additional measures were included after the first birth and prior to the second birth for restricted samples of teen mothers who had not had a second birth prior to the equivalent of twelfth grade. The sample restriction was necessary to ensure that these measures, which were taken in the 1992 survey, occurred before the second teen birth. These measures include receiving a high school diploma or a GED and attending some post-secondary education. Finally, for the restricted samples of teens who did not have a birth prior to the equivalent of twelfth grade, we included a measure of teen mothers who were either working, enrolled in classes, in an apprenticeship or training program, or in military duty in the equivalent of twelfth grade.

Sample Characteristics

Table 1 provides information on the characteristics of the two samples of teen mothers. Out of the full sample of 589 teen mothers, 34.5% had a second teen birth. Out of the sub-sample of 475 young teen mothers (those who were less than 18 years old at their first birth), 27.6% had a closely spaced second teen birth. Table 1 also shows that whites had the lowest

percentage of second teen births; however, there were no significant differences in the likelihood of a second teen birth by race/ethnicity for either sample.

Table 1 also presents the proportion of teen mothers with a second teen birth, by their age at first birth. Among the full sample of teen mothers (the first set of columns in Table 1), younger teens were most likely to have a second teen birth. For example, the majority of teen mothers who had a first birth at age 15 or under (62.1%) had a subsequent teen birth, compared with only 19.7% of teen moms who had a first birth when they were 18 or older. This pattern is similar for all racial/ethnic groups in the full teen mother sample. The second set of columns shows a reverse effect for closely spaced second teen births (within 24 months) among the sub-sample of young teen mothers. Interestingly, the youngest teen mothers were *less* likely to have a closely spaced second teen birth (21.2% of those age 15 and younger) than older teen mothers, (29.7% of those age 17 and older) although these differences were not significant.

Bivariate Analyses

Table 2 includes information on the characteristics of both the full sample of teen mothers and the sub-sample of young teen mothers, by whether or not they had a second teen birth. Significance levels are the result of t-tests, comparing differences between teen mothers who had only one teen birth with those who had a second teen birth (within 24 months for the sub-sample of young teen mothers). The final column shows comparison information on the average characteristics of all teen females from NELS:88 (although no statistical tests were run with the sample of all teen females).

There are significant differences in family, school and individual characteristics of teen mothers with one and two teen births for both samples, whether measured before or after the

pregnancy/birth. It should also be noted that, while the size of mean differences and statistical significance vary between the two samples of teen mothers, the overall patterns of the means are remarkably similar. For example, the first set of columns in Table 2 shows that among the full sample of teen mothers, those who had only one teen birth were more likely (52.3%) to have lived with both biological parents in the eighth grade than those who had a second teen birth (39.9%). The second set of columns shows that the same pattern exists in the sub-sample of young teen mothers (39.9% of teens with one birth, and 38.4% of teens with a second birth within 24 months), despite the lack of statistical significance. Also, these figures are all much lower than the 65.8% of all females in NELS:88 who lived with both biological parents in the eighth grade, reflecting the relative disadvantage of teen mothers compared with teen females overall.

The two samples of teen mothers had noticeably different patterns of means in only three domains: age at first birth, dropout status and marital status. In the full sample of teen mothers, those who had a second teen birth were significantly younger (16.8 years old) than those who had only one teen birth (17.5 years old). However, among young teen mothers, those who had a second teen birth within 24 months were *older* on average (17.2) than those with only one teen birth (16.8). A separate set of analyses (not shown here) indicates that these differences were significant for whites and blacks, but not Hispanics, and that, on average, younger mothers in the full sample of teen mothers had a longer period of time between their first and second teen births, which may account for the difference in their likelihood of having a second birth at any point in their teens compared with a closely spaced second teen birth.

In both samples of teen mothers, those who had only one teen birth were more likely to stay in school than those who had a second teen birth. However, when dropping out prior to first

pregnancy is examined, in the full sample of teen mothers, those with only one teen birth are 2.2% more likely (not significant) to drop out prior to first pregnancy than teens with a second teen birth, while in the sub-sample of young teen mothers, those with only one teen birth are 7.5% less likely (again not significant) to drop out prior to the first birth than those with a second closely spaced teen birth. Note that while less than 15% of all teens reported dropping out at any time, over half of teen mothers in either sample dropped out either prior to or after pregnancy (from Appendix A).

Among the sub-sample of young teen mothers, those who had only one birth were less likely to marry (37.8%) at any time than those who had a closely spaced second teen birth (55.0%, mean difference significant at $p<.001$), while these two figures are essentially identical in the full sample of teen mothers (39.1% and 38.4%, respectively, not significant) . This is in comparison to 11.8% of the full sample of teens. Note from Appendix A, that there are differences in marital status by race/ethnicity, with black teen mothers much less likely to marry (6.3%) than Hispanics (39.6%) or whites (52.9%).

Other factors associated with only one teen birth, for either or both samples, include higher SES of the teen's eighth grade school, enrollment in a gifted class, receiving minimal help with child care from the child's father, living with a parent or on their own, and higher perceived chances of graduating from high school.

Restricted Sample

Table 3 presents bivariate analyses of the restricted samples of teen mothers who had not had a second teen birth by the 1992 survey, including both the full sample of teen mothers (n=512) and the sub-sample of young teen mothers (n=414). The overall results shown in Table

3 again show similar patterns among the two samples of teen mothers. For example, females with only one teen birth were more likely to receive a high school diploma than females with a second teen birth, both in the full sample of teen mothers and in the sub-sample of young teen mothers (although this difference is not significant).

Other factors associated with having only one teen birth, in either or both samples after the equivalent of twelfth grade, include receipt of a GED, enrollment in further education, and being employed or enrolled, at least part time, after the first birth.

Multivariate Analyses

Table 4 presents multivariate models predicting the risk of a second teen birth for the sample of all teen mothers and the risk of a closely spaced second teen birth (within 24 months) for the sub-sample of young teen mothers. Logistic regressions were used and the coefficients reported are the transformed, exponentiated betas. A coefficient that is greater than one indicates the variable is associated with a greater likelihood of having a second teen birth; a coefficient that is less than one indicates a reduced likelihood of a second teen birth, after controlling for other variables in the models.

Some characteristics measured prior to the first birth were associated with the risk of a second birth. Race/ethnicity was associated with a second teen birth, with blacks more likely than whites to have a second teen birth for both samples, after controlling for other factors. Note that neither family SES nor family structure were significant in these models. Teens attending more disadvantaged schools (with a greater proportion of students receiving free lunches) were more likely to have a second teen birth, either within 24 months or at any point, while teens in the full sample who attended a school with a higher percentage minority students were less likely

to have a second birth. Measures of teen mothers' school performance and aspirations from prior to the first birth were not associated with the risk of a second teen birth in this model. However, teens who reported enrollment in a gifted class at some point prior to or during eighth grade were less likely to have had a second teen birth in the full teen mother sample.

Individual characteristics measured at or after the first teen birth were also associated with the likelihood of a second teen birth. Age at first birth was highly associated with the risk of a second birth for both samples, however, the direction of the effect was different. For the full teen mother sample, older teen mothers had a reduced odds of a second teen birth than younger mothers. In the sub-sample of young teen mothers, the older teen mothers were *more* likely to have had a closely spaced subsequent teen birth.

Staying in school continuously (or not dropping out at any point either prior to or after a pregnancy) is associated with a lower risk of having a second birth at any point in the teens for the full sample but not with a closely spaced second teen birth for the younger sub-sample. Note that in a separate set of models, dropout was measured either prior to or after pregnancy, and both variables were associated with a greater risk of a second teen birth. Thus the current model only compares those who had not dropped out with those who had dropped out at any time either prior to or after the first birth. Although marital status did not affect the risk of a second birth for the full sample of teen mothers, young teen mothers who did not marry at any time were only .55 times as likely to have a subsequent teen birth within 24 months.

Living situation and family supports measured after the first teen birth were also associated with the risk of a second teen birth. Among the full sample, teen mothers who lived with at least one of their parents after the birth of their first child were less likely to have had a second birth at any point in their teens, and those who lived on their own were also less likely

(compared with teens who lived with a boyfriend, spouse or other adult). Additionally, teens living in situations where the father of the child provided child care were more likely to have had a second teen birth either at any point or within 24 months. However, having a grandparent who helped with child care was not associated with the risk of a second birth.

Occupational aspirations were associated with the risk of a second teen birth. Teens who reported occupations that required more than a high school diploma were not less likely to have had a second teen birth. However, teens who reported an "other" aspiration (which was not classified into an occupational category) were less likely to have had a second teen birth.

According to an R^2 estimated in SAS, the model presented in Table 4 better explains the variance in a second teen birth for the full sample of teen mothers than for the sample of young teen moms.

Restricted Sample

Table 5 presents multivariate analyses of teens who had not had a second teen birth within 4 years of eighth grade, in order to examine the effects of characteristics measured at or after the twelfth grade, such as high school completion, on the risk of a second teen birth.

Model 1 in Table 5 replicates the analyses in Table 4, using the restricted samples. The size and significance of effects of Model 1 in Table 5 and the Table 4 models are similar for the two samples. The only major difference between the two models (in direction and significance of effect) is the positive effect of higher occupational aspirations on the risk of a second birth within 24 months. This may be an effect of unreasonably high occupational expectations.

Model 2 for each sample in Table 5 adds educational characteristics, employment status and welfare status after the first birth to the variables in Model 2. Receipt of a high school

degree and receipt of a GED were both associated with a reduced risk of a second teen birth, in comparison to receiving neither at any point in the teens. These effects did not occur in models predicting the risk of a closely spaced second teen birth. Enrollment in further education was not associated with a second teen birth, after controlling for diploma and GED status. Additionally, teens in families who had recently received welfare were not more likely than other teens to have a second teen birth in either sample. Finally, a measure of employment or enrollment status after the first birth was associated with postponing a second teen birth for both samples. In other words, teens who were neither active in work nor in school had a much greater risk of having either a second teen birth or a closely spaced second teen birth after the equivalent of twelfth grade. Note that this measure was taken in the equivalent of twelfth grade. The authors would not necessarily hypothesize a positive effect of working among younger teen mothers.

According to an R^2 estimated in SAS, Model 2 better explains variance in a closely spaced second birth among young teen mothers than the variance in a second teen birth among the full sample of teen moms. This difference is even more pronounced in Model 1.

Discussion

Approximately a third of the school-age teen mothers in our sample had a second birth at any time in their teens, and a little over a quarter of those who had a first birth before age 18 had a closely spaced second teen birth within 24 months. This research demonstrates heterogeneity in outcomes among school-age teen mothers. Multiple factors -- measured prior to pregnancy, at the time of the birth, and after the first birth -- were associated with a second teen birth.

One of the more surprising outcomes is the different effect of age at first birth on outcomes among the two samples; teen mothers had a greater likelihood of a second birth at any

time in their teens if their first birth occurred in their early teens; however, these same younger teen mothers were less likely than older teen mothers to have a closely spaced subsequent teen birth. The second part of these findings is counter to other research on fertility outcomes among teen mothers and may be due to several factors. First, our sample consists of teens who had a first birth within four years of eighth grade. Thus, this is a more homogeneous sample than a full sample of teen mothers that may include high school graduates who are in their late teens at first birth. Second, the sample was limited to those teens who were enrolled in eighth grade and doesn't include teen mothers who may have left school due to a pregnancy at an earlier age. Third, the sample was further restricted to teens who responded to all waves of the survey. Although NCES made efforts to track dropouts, the panel sample remains more advantaged than those who were lost to the study (NCES, 1994). Finally, since those teens who may have had a first birth prior to age 16 are legally required to stay in school, the youngest teens may have been the least likely to permanently drop out of school (which is associated with subsequent fertility). Subsequent analyses (not shown here) indicate that mothers who were 18 or 19 at first birth were more likely to have a closely-spaced second birth, even when they were followed into their twenties. Also, the youngest teen mothers were least likely to marry and to drop out prior to pregnancy; however they were more likely to drop out after pregnancy and less likely to eventually obtain their high school diploma.

This research points to the policy importance of getting teen mothers involved in educational or employment activities after the birth of their first child. Those teen mothers who were involved even part-time in classes or work or a training program after the equivalent of twelfth grade had a lower risk of a second teen birth. Conversely, those teen mothers who were not engaged in outside activities were most likely to have another child in their teens.

Additionally, teen mothers who finished their GED or diploma were likely to postpone a second teen birth, in comparison with those who received no diploma or credential. The effect of obtaining a GED on second birth outcomes was as large as the effect of receiving a diploma, suggesting that programs that help teen mothers obtain a GED may have positive effects on other outcomes. The positive effects of involvement in educational and employment activities after the birth of the first child suggests that teens who have more positive perceptions of future activities may be more likely to postpone having another teen birth.

Teen mothers who lived with their parents after their first birth and those who did not marry were less likely to have a second teen birth. This suggests that a combination of keeping a teenage mother in school, living at home, and unmarried may help postpone a second teen birth. Interestingly, those who reported that the father of their child was involved in child care activities were more likely to have a second birth, even after controlling for marital status. This implies that teens act rationally, and, like older mothers, are more likely to consider having another child if they perceive the father is supportive of the current child. NELS:88 data have limited information on partner characteristics, but additional research should pursue the influence of fathers on subsequent fertility outcomes among teen mothers.

There were limited effects of family background characteristics on outcomes among teen mothers. There were no bivariate or multivariate relationships between family SES and fertility outcomes among this sample, perhaps because it was a fairly homogeneous sample to begin with. Additionally, although there were no racial/ethnic differences in the likelihood of a second teen birth in bivariate analyses, blacks were significantly more likely to have a second teen birth in the multivariate models. This corresponds with national figures which show a higher percentage of repeat teen births among blacks. The black teen mothers in our sample had different

characteristics than white and Hispanic teen mothers. For example, black teen mothers were less likely to marry or have a boyfriend, more likely to live with a parent or with an other adult after the birth of their first child, and less likely to drop out of school. Separate analyses by race/ethnicity with larger samples of teen mothers may help tease out the effects of background characteristics on outcomes among teen mothers from multiple racial ethnic groups.

Finally, school characteristics had an effect on fertility outcomes among teen mothers, even after controlling for family and individual effects. The SES of the student body was associated with fertility outcomes in all models. School SES reflects a student's environment in eighth grade and confirms that characteristics of an important social environment may influence outcomes among teens. In addition, those teens (especially Hispanic and black teens) who attended eighth grade schools with a higher percentage minority population were less likely to have a second teen birth. This may reflect programs in high minority population schools associated with dropout or pregnancy prevention.

Acknowledgments

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Endnotes

1. While in many longitudinal studies attrition over time results in a panel sample which is more advantaged than the original sample, in NELS:88 special care was taken to retain more disadvantaged teens, especially high school drop outs. In this sample, the use of only teens who had full panel data was not found to result in an especially advantaged group of teen mothers.

2. Because of the small sample sizes of Asian and American Indian teens, these groups were merged into the white reference category.

FIGURE 1: TEEN BIRTH RATE BY BIRTH ORDER

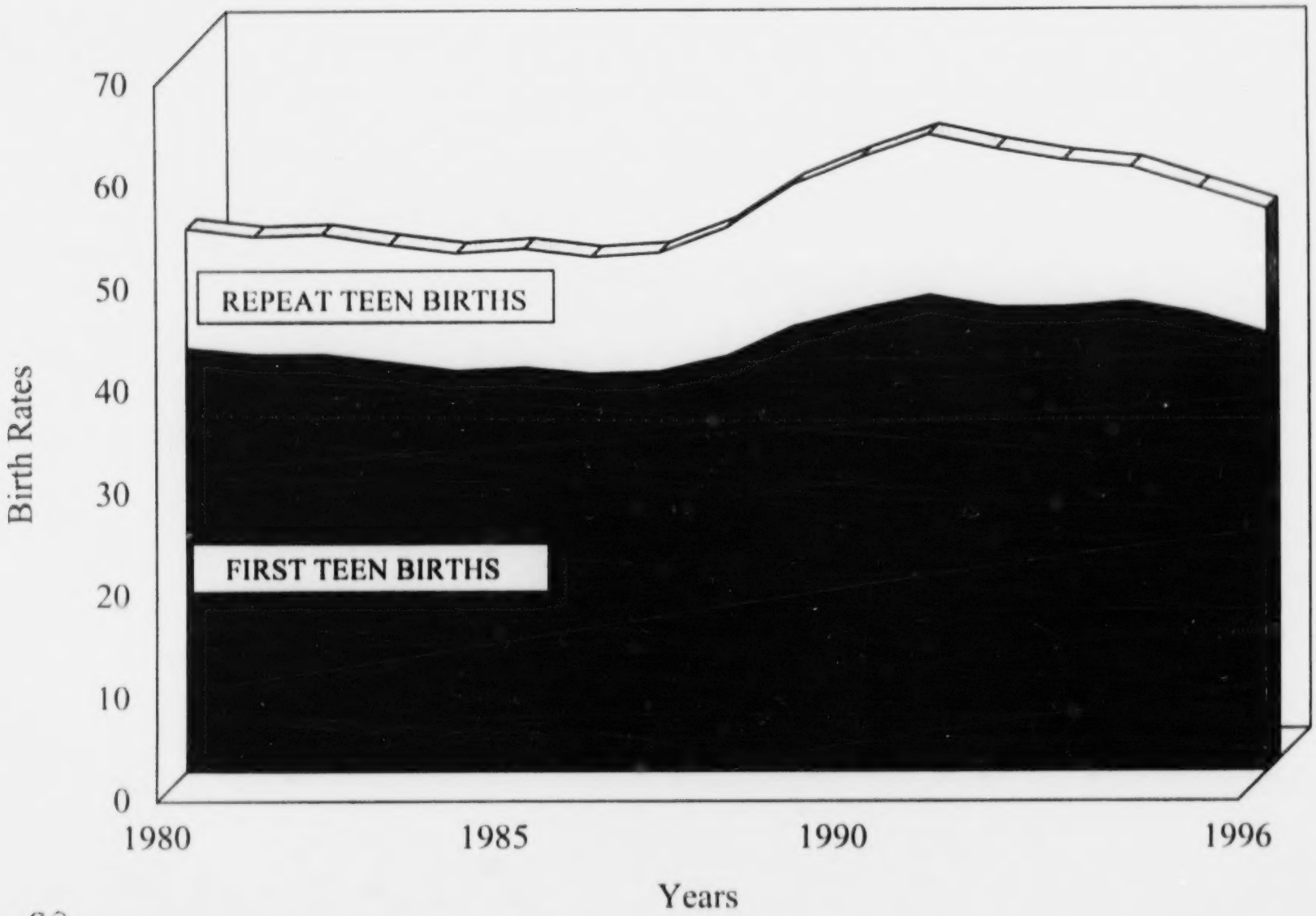

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TABLE 1: SAMPLE CHARACTERISTICS OF TEEN MOTHERS

Sample Characteristics	**% With a 2nd Teen Birth**				**% With a 2nd Teen Birth within 24 Months**			
	Total Sample	**White**	**Black**	**Hispanic**	**Total Sample**	**White**	**Black**	**Hispanic**
	34.5%	31.2%	40.6%	36.4%	27.6%	25.0%	32.4%	29.1%
Age at 1st Teen Birth								
15 or younger	62.1%	53.6%	66.7%	71.4%	21.2%	14.3%	25.0%	28.6%
16	44.7%	40.3%	51.4%	47.2%	26.7%	20.8%	35.1%	30.6%
17[a]	29.4%	26.8%	26.3%	41.4%	29.7%	28.9%	34.0%	28.3%
18 or older	19.7%	22.5%	26.5%	7.9%				
	*	*	*	*				
Sample Size	589	327	133	129	475	264	108	103

[a] Age 17 includes those 17 and older for those having a second teen birth within 24 months.

* F-test of association is statistically significant ($p<.01$).

TABLE 2: AVERAGE CHARACTERISTICS OF TEEN MOTHERS BY AGE AT FIRST BIRTH, NUMBER OF TEEN BIRTHS, AND BIRTH SPACING, PLUS CHARACTERISTICS OF ALL TEEN FEMALES

	FIRST BIRTH IN TEENS		FIRST BIRTH BEFORE AGE 18		
	One Teen Birth	Second Birth In Teens	One Teen Birth	Second Birth w/in 24 months	All Teen Females
FAMILY BACKGROUND					
Family Structure, SES					
Family SES (mean=0, s.d.=1)	-0.69	-0.71	-0.64	-0.77	-0.13
Two Biological Parents	52.3%	39.9% **	49.4%	43.5%	65.8%
SCHOOL AND CLASSROOM CHARACTERISTICS					
School					
% Minority at 8th Grade School	36.6%	36.5%	36.2%	36.4%	26.6%
% Receiving Free Lunch at 8th Grade School	32.2%	36.5% *	31.9%	37.4% *	24.9%
INDIVIDUAL CHARACTERISTICS PRIOR TO FIRST BIRTH (8th grade)					
School Performance					
Standardized Test Score	44.02	43.51	44.32	43.42	50.90
Post-Sec. Education Plans (1=less than high school, 6=post-college)	3.7	3.7	3.8	3.7	4.62
Enrolled in Gifted Class by 8th Grade	10.6%	4.9% **	9.6%	6.9%	17.9%
Religious Involvement	10.1%	5.9%	8.4%	5.3%	15.3%

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Table 2 (Continued)

	FIRST BIRTH IN TEENS		FIRST BIRTH BEFORE AGE 18		
	One Teen Birth	Second Birth In Teens	One Teen Birth	Second Birth w/in 24 months	All Teen Females
INDIVIDUAL CHARACTERISTICS AT OR AFTER PREGNANCY OR FIRST BIRTH					
Age at First Birth	17.5	16.8 ***	16.8	17.2 ***	--
Drop Out Status					
Dropped out prior to first pregnancy	24.4%	22.2%	17.7%	25.2%	--
Dropped out after first pregnancy	26.6%	43.3% ***	34.0%	42.7%	--
Did not drop out	49.0%	34.5% ***	48.3%	32.1% **	85.9%
Marital Status					
Married prior to first birth	23.6%	20.2%	16.9%	23.7%	--
Married after first birth	16.3%	18.2%	20.9%	31.3% *	--
Did not marry	60.1%	61.6%	62.2%	45.0% ***	88.2%
Child Care Received After 1st Birth (1=not at all, 3=most of the time)	•				
Grandparent helped with child care	2.2	2.2	2.2	2.2	--
Father of child helped with child care	1.9	2.1 **	1.9	2.2 ***	--
Living Situation After First Birth					
Lived with a Parent	50.3%	42.4%	52.0%	39.7% *	74.7%
Lived with a Husband or Boyfriend	32.9%	42.9% *	32.0%	44.3% *	8.2%
Lived on Own	12.7%	7.4% *	11.6%	9.2%	14.6%
Lived with Other Adult	4.1%	7.4%	4.4%	6.9%	2.5%
Aspirations After First Child					
Chances of Graduating from High School (1= very low , 5=very high)	3.60	3.49	3.72	3.37 *	4.36
More than high school education required for Occupational Aspirations	54.1%	57.6%	55.8%	55.7%	59.9%
Other Occupational Aspirations	9.1%	4.9%	7.6%	5.3%	7.9%
Sample Size	386	203	344	131	8349

* p< .05 ** p< .01 *** p< .001

Note: Significance levels are taken from t tests comparing teen mothers who had a second teen birth with those who had only one teen birth

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TABLE 3: AVERAGE CHARACTERISTICS OF TEEN MOTHERS AMONG THOSE WHO DID NOT HAVE A SECOND TEEN BIRTH BY 12TH GRADE

	FIRST BIRTH IN TEENS		FIRST BIRTH BEFORE AGE 18		
	One Teen Birth	Second Birth In Teens	One Teen Birth	Second Birth w/in 24 months	All Teen Females
INDIVIDUAL CHARACTERISTICS AFTER FIRST BIRTH					
Educational Status After First Birth					
Received High School Diploma	41.7%	28.6% **	41.6%	35.7%	71.5%
Received GED	16.1%	7.1% **	16.6%	12.9%	3.8%
Received Neither Diploma nor GED	42.2%	64.3% ***	41.8%	51.4%	24.7%
Enrolled in Further Education	26.2%	16.1% *	26.2%	17.4%	66.9%
Family went on welfare in the last 2 years (measured after first birth)	15.0%	17.5%	14.5%	18.6%	5.7%
Employed or Enrolled After First Birth	60.6%	46.0% **	62.5%	42.9% **	73.3%
Sample Size	386	126	344	70	8272

* p<.05 **p<.01 ***p<.001

Note: Significance levels are taken from t-tests comparing teen mothers who had a second teen birth with those who had only one teen birth

TABLE 4: MULTIVARIATE MODELS PREDICTING THE RISK OF A SECOND TEEN BIRTH

	First Birth in Teens & Second birth in teens	First birth Before Age 18 & Second birth within 24 months
FAMILY BACKGROUND		
Race/Ethnicity		
Black	1.92 *	3.04 **
Hispanic	1.80	1.68
White	1.00	1.00
Family Structure, SES		
Family SES (mean=0, s.d.=1)	1.17	0.93
Two Biological Parents	0.71	0.81
SCHOOL AND CLASSROOM CHARACTERISTICS		
School		
% Receiving Free Lunch at 8th Grade School	1.02 **	1.01 *
% Minority at 8th Grade School	0.99 **	0.99
INDIVIDUAL CHARACTERISTICS PRIOR TO FIRST BIRTH (8th grade)		
School Performance		
Standardized Test Score	1.00	0.99
Post-Sec. Education Plans (1=less than high school, 6=post-college)	0.99	0.97
Enrolled in Gifted Class by 8th Grade	0.42 *	0.72
Religious Involvement	0.59	0.66
INDIVIDUAL CHARACTERISTICS AT OR AFTER PREGNANCY OR FIRST BIRTH		
Age at First Birth	0.95 ***	1.04 ***
Drop Out Status		
Did not drop out at any time	0.56 *	0.60
Dropped out prior to or after first pregnancy	1.00	1.00
Marital Status		
Did not marry	1.07	0.55 *
Married prior to or after first birth	1.00	1.00

TABLE 4: MULTIVARIATE MODELS PREDICTING THE RISK OF A SECOND TEEN BIRTH, (Continued)

	First Birth in Teens & Second birth in teens	First birth Before Age 18 & Second birth within 24 months
INDIVIDUAL CHARACTERISTICS AT OR AFTER PREGNANCY OR FIRST BIRTH (continued)		
Child Care Received After 1st Birth (1=not at all, 3=most of the time)		
Grandparent helped with child care	1.04	0.92
Father of child helped with child care	1.57 **	1.60 **
Living Situation After First Birth		
Lived with at Least One Parent	0.53 **	0.70
Lived Alone	0.42 *	0.70
Lived in Other Situation (with boyfriend or husband or other adult)	1.00	1.00
Aspirations After First Birth		
Chances of Graduating from High School (1= very low , 5=very high)	1.02	0.97
More than high school education required for Occupational Aspirations	1.00	0.95
Other Occupational Aspirations	0.49 *	0.81
-2 Log likelihood	122.99	63.77
Degrees of freedom	20	20
Sample Size	589	475

* p<.05 **p<.01 ***p<.001

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TABLE 5: MULTIVARIATE MODELS PREDICTING THE RISK OF A SECOND TEEN BIRTH FOR THOSE WHO DID NOT HAVE A 2ND TEEN BIRTH BY 12TH GRADE

	First Birth in Teens & Second birth in teens		First Birth Before Age 18 & Second teen birth within 24 months	
	Model 1	Model 2	Model 1	Model 2
FAMILY BACKGROUND				
Race/Ethnicity				
Black	1.46	1.63	2.67	3.45 *
Hispanic	1.63	1.61	1.63	1.82
White	1.00	1.00	1.00	1.00
Family Structure, SES				
Family SES (mean=0, s.d.=1)	1.42	1.36	1.44	1.38
Two Biological Parents	0.72	0.75	0.67	0.73
SCHOOL AND CLASSROOM CHARACTERISTICS				
School				
% Receiving Free Lunch at 8th Grade School	1.02 **	1.01 *	1.02 *	1.02 *
% Minority at 8th Grade School	0.99 *	0.99 *	0.99 *	0.98 *
INDIVIDUAL CHARACTERISTICS PRIOR TO FIRST BIRTH (8th grade)				
School Performance				
Standardized Test Score	1.00	1.02	0.99	1.00
Post-Sec. Education Plans (1=less than high school, 6=post-college)	0.95	0.99	0.96	0.95
Enrolled in Gifted Class by 8th Grade	0.41	0.38	0.74	0.78
Religious Involvement	0.67	0.80	0.99	1.11
INDIVIDUAL CHARACTERISTICS AT OR AFTER PREGNANCY OR FIRST BIRTH				
Age at First Birth	0.96 ***	0.96 ***	1.14 ***	1.14 ***
Drop Out Status				
Did not drop out at any time	0.68	---	0.90	---
Dropped out prior to or after first pregnancy	1.00		1.00	
Marital Status				
Did not marry	1.03	0.97	0.69	0.66
Married prior to or after first birth	1.00	1.00	1.00	1.00

TABLE 5: MULTIVARIATE MODELS PREDICTING THE RISK OF A SECOND TEEN BIRTH, (Continued)

	First Birth in Teens & Second birth in teens		First Birth Before Age 18 & Second teen birth within 24 months	
	Model 1	Model 2	Model 1	Model 2
INDIVIDUAL CHARACTERISTICS AT OR AFTER PREGNANCY OR FIRST BIRTH (Continued)				
Child Care Received After 1st Birth (1=not at all, 3=most of the time)				
Grandparent helped with child care	1.15	1.13	1.08	1.02
Father of child helped with child care	1.42 *	1.46 *	1.50	1.54 *
Living Situation After First Birth				
Lived with at Least One Parent	0.58 *	0.62	0.77	0.85
Lived Alone	0.53	0.55	0.95	1.11
Lived in Other Situation (with boyfriend or husband or other adult)	1.00	1.00	1.00	1.00
Aspirations After First Child				
Chances of Graduating from High School (1= very low , 5=very high)	0.99	1.03	0.84	0.84
More than high school education required for Occupational Aspirations	1.54	1.59	2.64 **	2.48 *
Other Occupational Aspirations	0.73	0.74	2.13	1.87
INDIVIDUAL CHARACTERISTICS AFTER FIRST BIRTH				
Educational Status After First Birth				
Received High School Diploma		0.51 *		0.92
Received GED		0.27 **		0.55
Received Neither Diploma nor GED		1.00		1.00
Enrolled in Further Education		0.84		1.16
Family went on welfare in the last 2 years (measured after first birth)		0.96		1.25
Employed or Enrolled After First Birth		0.52 **		0.46 *
-2 Log likelihood	62.21	84.53	85.63	93.36
Degrees of freedom	20	24	20	24
Sample Size	512	510	414	412

* p< 05 **p< 01 ***p< 001

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Appendix A: Definition, Range, and Means of Variables, by Sample Year

Variables	Definition	Range	Variable Means (S.D.)			
			Teen Mothers	White Teen Mothers	Black Teen Mothers	Hispanic Teen Mothers
FAMILY BACKGROUND						
Race/Ethnicity	Hispanic (1=Yes)	0-1	21.9% (.41)	--	--	--
	African American (1=Yes)	0-1	22.6% (.42)	--	--	--
	White (including Asian/Pacific Islander and American Indian) (1=Yes)	0-1	50.9% (.50)	--	--	--
Family Structure, SES						
Family SES	Socioeconomic status composite constructed from base year parent report of father's and mother's education and occupation and family income. Standardized, mean=0 and s.d.=1	-2.5 - 1.1	-.70 (.64)	-.57 (.62)	-.83 (.64)	-.88 (.62)
Two Biological Parents	Respondent lived with biological mother and father in 8th grade (1=Yes)	0-1	48.0% (.50)	52.6% (.50)	24.8% (.43)	60.5% (.49)
SCHOOL / CLASSROOM CHARACTERISTICS						
% Minority Students at 8th Grade School	Percent of Non-White students attending 8th grade school	0-100	36.55 (33.01)	18.67 (23.65)	55.91 (28.18)	61.93 (30.14)
% Receiving Free Lunch at 8th Grade School	Percent of students attending 8th grade school receiving free lunch	0-100	33.70 (23.86)	27.61 (19.22)	40.67 (25.72)	41.95 (27.92)

Appendix A: Definition, Range, and Means of Variables, by Sample Year (continued)

Variables	Definition	Range	Variable Means (S.D.) Teen Mothers	White Teen Mothers	Black Teen Mothers	Hispanic Teen Mothers
INDIVIDUAL CHARACTERISTICS PRIOR TO FIRST BIRTH						
School Performance Standardized Test Score	Respondent standardized scores on composite math and English tests administered in 8th grade	31.0 - 65.4	43.85 (6.97)	45.64 (7.23)	41.49 (5.98)	41.71 (5.89)
Post-Sec. Education Plans	Respondent reported post-secondary plans (1=won't finish high school, 6=higher level of school after college)	1-6	3.72 (1.45)	3.64 (1.45)	4.10 (1.40)	3.51 (1.46)
Enrolled in Gifted Classes by 8th Grade	Enrolled in classes for gifted students in 8th grade (1=Yes)	0-1	8.7% (.28)	8.3% (.28)	7.5% (.26)	10.9% (.31)
Religious Involvement	Respondent participated as a member or an officer in a religious organization at school in 8th grade (1=Yes)	0-1	8.7% (.28)	8.9% (.28)	7.5% (.26)	9.3% (.29)
INDIVIDUAL CHARACTERISTICS AT OR AFTER PREGNANCY OR FIRST BIRTH						
Age at First Birth	Age in months at the time of first birth	148-239	207.18 (13.09)	208.04 (12.28)	204.73 (14.21)	207.53 (13.68)
Dropout Status: Dropped out prior to first pregnancy	Respondent dropped out 9 or more months prior to having a first birth. (1=Yes)	0-1	23.6% (.42)	25.7% (.44)	9.0% (.29)	33.3% (.47)
Dropped out after first pregnancy	Respondent dropped out by a second birth (1=Yes)	0-1	32.4% (.47)	31.8% (.47)	34.6% (.48)	31.8% (.47)
Did not drop out	Respondent did not drop out of high school (1=Yes)	0-1	44.0% (.50)	42.5% (.50)	56.4% (.50)	34.9% (.48)

Appendix A: Definition, Range, and Means of Variables, by Sample Year (continued)

Variables	Definition	Range	Variable Means (S.D.) Teen Mothers	White Teen Mothers	Black Teen Mothers	Hispanic Teen Mothers
Marital Status						
Married before or during first pregnancy	Marriage occurred one or more months prior to first birth. (1=Yes)	0-1	22.4% (.42)	30.0% (.46)	1.0% (.09)	25.6% (.44)
Married after first birth	Marriage occurred at the time of or after first birth. (1=Yes)	0-1	17.0% (.38)	22.9% (.42)	5.3% (.22)	14.0% (.35)
Did Not Marry	No marriage occurred prior to a second birth. (1=Yes)	0-1	59.8% (.49)	46.2% (.50)	94.0% (.24)	58.9% (.49)
Child Care						
Grandparent	Grandparent helped with child care after the 1st birth (1=not at all, 3=most of the time)	1-3	2.19 (.55)	2.12 (.49)	2.32 (.63)	2.24 (.58)
Father	Father helped with child care after the 1st birth (1=not at all, 3=most of the time)	1-3	2.00 (.73)	2.02 (.74)	1.98 (.71)	1.97 (.75)
Living arrangements after first birth						
Lived with parent	Respondent lived with at least one parent (lived with at least one mother, stepmother, father, or stepfather) after her first birth (1=Yes)	0-1	47.5% (.50)	42.5% (.50)	67.0% (.47)	40.3% (.49)
Lived with a husband or boyfriend	Respondent lived with a husband or boyfriend after her first birth (1=Yes)	0-1	36.3% (.48)	45.6% (.50)	6.0% (.24)	44.2% (.50)
Lived on own	Respondent lived on her own after her first birth (1=Yes)	0-1	10.9% (.31)	9.5% (.29)	13.5% (.34)	11.6% (.32)
Lived with other adult	Respondent lived with other adult after her first birth (1=Yes)	0-1	5.3% (.22)	2.4% (.15)	13.5% (.34)	3.9% (.19)

Appendix A: Definition, Range, and Means of Variables, by Sample Year (continued)

			Variable Means (S.D.)			
Variables	**Definition**	**Range**	**Teen Mothers**	**White Teen Mothers**	**Black Teen Mothers**	**Hispanic Teen Mothers**
Aspirations after first birth						
Chances of Graduating from High School	Respondent's perceived chances of graduating from high school (1=very low, 5=very high)	1-5	3.56 (1.48)	3.54 (1.54)	3.89 (1.30)	3.28 (1.43)
Education Required for Occupation	More than high school education required for occupational aspirations (1=Yes)	0-1	55.3% (.50)	56.6% (.50)	61.7% (.49)	45.7% (.50)
Other Occupational Aspirations	Respondent expected to be employed but did not specify the type of occupation desired (1=Yes)	0-1	15.1% (.36)	13.1% (.34)	19.5% (.40)	15.5% (.36)
N	Sample Size		589	327	133	129

Appendix B: Definition, Range, and Means of Variables, by Sample Year

			Variable Means (S.D.)			
Variables	**Definition**	**Range**	**Teen Mothers**	**White Teen Mothers**	**Black Teen Mothers**	**Hispanic Teen Mothers**
INDIVIDUAL CHARACTERISTICS AFTER FIRST BIRTH						
Second teen birth	Second teen birth occurred prior to 12th grade (1=Yes)	0-1				
Educational status Recieved High School Diploma	Respondent received a high school diploma after her first birth (1=Yes)	0-1	38.5% (.49)	39.1% (.49)	41.9% (.50)	33.3% (.47)
Received GED	Respondent received a GED after her first birth (1=Yes)	0-1	13.9% (.35)	14.7% (.35)	14.3% (.35)	11.1% (.32)
Received Neither Diploma or GED	Respondent received neither a diploma nor a GED after her first birth (1=Yes)	0-1	47.7% (.50)	46.2% (.50)	43.8% (.50)	55.6% (.50)
Enrolled in Further Education	Respondent enrolled in some type of post-secondary education after her first birth (1=Yes)	0-1	23.7% (.43)	23.8% (.43)	26.7% (.44)	20.6% (.41)
Welfare	Family went on welfare in the last 2 years measured at the 12th grade interview. (1=Yes)	0-1	15.6% (.36)	12.7% (.33)	15.2% (.36)	24.1% (.43)
Employed or Enrolled	Respondent was working part-time or full-time, enrolled in classes, in an apprenticeship or training program, or in military duty after her first birth (1=Yes)	0-1	57.0% (.50)	57.5% (.50)	60.0% (.49)	53.8% (.50)
Sample of 2nd Teen Births Prior to 12th grade After 12th grade Total			 77 126 203	 28 74 102	 28 26 54	 21 26 47
N	Sample Size		512	299	105	108